

C L A I M S

1. A formaldehyde-free aqueous binder composition comprising:
 - a binder component (A) obtainable by reacting at least one alkanolamine with at least one carboxylic anhydride and, optionally, treating the reaction product with a base; and
 - a binder component (B) which comprises at least one carbohydrate.
2. The formaldehyde-free aqueous binder composition of claim 1 wherein binder component (A) comprises the reaction product of at least one alkanolamine with at least one carboxylic anhydride in an equivalent ratio of amine and hydroxy groups ($\text{NH}+\text{OH}$) to carboxy groups (COOH) of at least 0.4, preferably at least 0.6.
3. The formaldehyde-free aqueous binder composition of claim 1 or 2 wherein the equivalent ratio of amine and hydroxy groups ($\text{NH}+\text{OH}$) to carboxy groups (COOH) in the final binder composition is 2.0 or less, preferably 1.7 or less.
4. The formaldehyde-free aqueous binder composition of any one of claims 1 to 3 which comprises 60 wt.% or more of binder component (A); and 40 wt% or less of binder component (B), based on the total solids content of components (A) and (B).
5. The formaldehyde-free aqueous binder composition of claim 4 which comprises 60 to 95 wt.% of binder component (A); and 5 to 40 wt% of binder component (B), based on the total solids content of components (A) and (B).
6. The formaldehyde-free aqueous binder composition of claim 5 which comprises 60 to 80 wt.% of binder component (A); and 20 to 40 wt% of binder component (B), based on the total solids content of components (A) and (B).

7. The formaldehyde-free aqueous binder composition of any one of claims 1 to 6 wherein the at least one carboxylic anhydride is selected from cycloaliphatic and/or aromatic anhydrides.

8. The formaldehyde-free aqueous binder composition of claim 7 wherein the carboxylic anhydride comprises a combination of a cycloaliphatic and an aromatic anhydride.

9. The formaldehyde-free aqueous binder composition of claim 8 wherein the molar ratio of cycloaliphatic anhydride to aromatic anhydride is within the range of from 0.1 to 10, preferably 0.5 to 3.

10. The formaldehyde-free aqueous binder composition of any one of claims 7 to 9 wherein cycloaliphatic anhydride is selected from the group consisting of tetrahydrophthalic anhydride, hexahydrophthalic anhydride and methyl-tetrahydrophthalic anhydride.

11. The formaldehyde-free aqueous binder composition of any one of claims 7 to 10 wherein the aromatic anhydride is selected from the group consisting of phthalic anhydride, methylphthalic anhydride, trimellitic anhydride and pyromellitic dianhydride.

12. The formaldehyde-free aqueous binder composition of any one of claims 1 to 11 wherein the alkanolamine is selected from the group consisting of diethanolamine, triethanolamine, diisopropanolamine, triisopropanolamine, methyldiethanolamine, ethyldiethanolamine, n-butyldiethanolamine, methyl-diisopropanolamine, ethylisopropanolamine, 3-amino-1,2-propanediol, 2-amino-1,3-propanediol and tris(hydroxymethyl)aminomethane.

13. The formaldehyde-free aqueous binder composition of any one of claims 1 to 12 wherein the at least one carbohydrate is selected from the group consisting of monosaccharides such as xylose, glucose and fructose; disaccharides such as sucrose, maltose and lactose; oligosaccharides such

as glucose syrup and fructose syrup; and preferably water-soluble polysaccharides such as pectin, dextrin, starch, modified starch and starch derivatives.

14. The formaldehyde-free aqueous binder composition of any one of claims 1 to 13 further comprising a curing accelerator and, optionally, other conventional binder additives.

15. A method of producing a bonded mineral fiber product which comprises the steps of contacting the mineral fibers or mineral fiber product with a formaldehyde-free aqueous binder composition according to any one of claims 1 to 14, and curing the binder composition.

16. Mineral fiber product comprising mineral fibers in contact with the cured binder composition according to any one of claims 1 to 14.